

Microstructure and Magnetic Properties of CeFeB Powder Prepared by High-energy Ball Milling

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The cost and availability pressure of rare-earth (RE), especially for Nd and Dy that are essential for high performance of Nd₂Fe₁₄B-type permanent magnets (PM), have forced the research on more economically materials. In this sense Ce is of interest given that it is the most abundant RE element. In powder technology, which is the preferred method of PM preparation, keeping of hard magnetic properties unaltered during the milling process, it is a challenge. Considering these aspects, the aim of our work is to investigate the effect of the milling environment on the microstructure and magnetic properties of Ce-Fe-B powders prepared by high-energy ball milling starting from Ce_{10+x}Fe_{84-x}B₆ ($x=0-6$) ribbons. By controlling the parameters of milling, we have managed to obtain powders with H_c=5.95 kOe, M_r=7.56 kG, and (BH)_{max}=8.16 MGOe, values are almost identical to those of the precursors.

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